EXHIBIT C

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF WASHINGTON

CITY OF SPOKANE, a municipal corporation located in the County of Spokane, State of Washington, Plaintiff, -vs- MONSANTO COMPANY, et al., Defendants.	Case No. 2:15-cv-00201-SMJ

SHOOK HARDY & BACON
2001 MARKET STREET - SUITE 3000
PHILADELPHIA, PENNSYLVANIA 19103
DECEMBER 18, 2019
10:14 A.M.

VIDEOTAPED DEPOSITION OF LISA A. RODENBURG, PH.D.

REPORTED BY:
DEBRA SAPIO LYONS, RDR, CRR, CRC, CCR, CLR, CPE
JOB NO. 173395

to ask you all the same questions that I asked you in those depositions or can we assume that they accurately reflect the opinions that you hold in this case?

MR. LAND: Objection, vague.

MR. GOUTMAN: Okay. Let me -- let me be more specific.

BY MR. GOUTMAN:

Q. I asked you a series of questions concerning the identity of congeners that have been described as byproduct PCBs.

Have your opinions changed on that since June of 2019, several months ago, since we last took your deposition?

A. No.

Q. Same question with respect to the concentration of those congeners.

MR. LAND: Objection, vague.

Concentration in general products, in stormwater?

BY MR. GOUTMAN:

Q. The questions that I asked concerning the reported concentrations of byproduct congeners in pigments in particular,

has your -- have your opinions changed since June?

A. No, not that I know of.

Q. Okay. The types of products in which byproduct PCBs are found, have your opinions changed?

A. No.

Q. The ubiquity of byproduct PCBs in the environment, have your opinions changed?

A. No.

Q. The lack of enforcement as described in your last deposition by the EPA of the 50 ppm standard with respect to byproduct PCBs?

A. As described in my deposition, I answered that question truthfully and my opinion has not changed.

Q. Okay. The fact that the -- over the past couple decades virtually all of the pigments are being imported from China and India, your opinions haven't changed concerning that; correct?

A. As far as --

MR. LAND: Objection, assumes facts

and vague.

Go ahead.

THE WITNESS: As far as I know, no, my opinions have not changed.

BY MR. GOUTMAN:

Q. Yeah. And, in fact, you've written on that; correct?

A. Yes, and I haven't written anything since that last deposition, so there would be no -- nothing new to contradict what I said in the deposition.

Q. The fact that by -- we asked you questions concerning the fact that byproduct PCBs have been detected in numerous bodies of water, which by themselves exceed the Federal Water Quality Standard, your opinions haven't changed with respect to those questions that we asked you?

A. Correct.

MR. GOUTMAN: There, we accomplished something.

MR. LAND: All right.

MR. GOUTMAN: This will dispense with about 20 pages of questions.

in a sample.

BY MR. GOUTMAN:

Q. So your answer is yes?

A. Yes.

Q. In addition, of course, there are other manufacturing processes that produce byproduct PCBs. You're aware of that; right?

A. Yes.

Q. And the EPA in 1983, when they passed regulations on this, listed some 200 manufacturing processes that could potentially create byproduct PCBs. You're aware of that?

A. Yes.

Q. And that list was collected in a paper that Mr. Coghlan, one of Plaintiff's experts, was brought to our attention, which I'm about to show you.

A. Okay.

MR. GOUTMAN: We'll mark this as Exhibit 9.

(Exhibit Rodenburg-9, multipage document entitled Pollution Prevention and Management Strategies for Polychlorinated Biphenyls in the New York/New Jersey

River watershed; correct?

A. That is correct.

Q. Would you agree that combustion reactions can create PCBs?

A. Yes.

MR. GOUTMAN: Why don't we go to Ishikawa. Just give me all of those.

(Exhibit Rodenburg-10, multipage document entitled PCB decomposition and formation in thermal treatment of plant equipment, is marked for identification.)

BY MR. GOUTMAN:

Q. We've marked as Exhibit 10 a paper by Ishikawa, et al. called, "PCB decomposition and formation in thermal treatment of plant equipment."

Are you familiar with this paper?

A. It's not ringing a bell, no.

Q. Okay. What this papers shows, and you can take a second and read it, I'm just going to direct your attention to a few passages, but they basically -- excuse me for coughing -- they basically ran combustion experiments, just looking at the top of the

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BY MR. GOUTMAN:

Q. Why don't we go back to this paper by Ishikawa. It says, "PCB concentration" -- this is the second paragraph, the conclusion. "PCB concentration and the number of congeners increased at the kiln exit. While this behavior was common to RDF and ASR, the increase in PCB concentration at the kiln exit was greater with the combustion of ASR than KDF."

So what they're saying there is that different types of refuse produce different types of PCBs or different amounts of PCBs; correct?

A. Yes, that's what they're saying.

Q. And they say later that it produced different types of PCBs; correct?

A. That -- yes, that is what it says.

Q. It says a couple sentences down, [as read]: "And, the predominate homologues were higher PCBs such as hepta-C -- CB and deca-CB with the combustion of ASR, while the lower chlorinated PCBs, such as DiPCB and penta-PCB were with the combustion of RDF";

right?

A. That's what it says, yes.

Q. So here they're saying that it was producing PCBs with different degrees of chlorination depending upon the kind of refuse that was being incinerated; correct?

A. That's what it's saying, yes.

Q. And they give, in fact, later identify specific congeners. Going to the first full paragraph on the right column, a few lines down, [as read]: "The combustion marker congeners for RDF were numbers 13/12, 35, 77, 126, while those for ASR were 170, 189, 194, 195, 196, 206, and 209. In combustion of RDF, non-ortho-PCB were predominantly formed, whereas ortho-PCB or symmetric chlorine substituted by PCB were destroyed. Higher chlorinated PCB were more readily formed by combustion of ASR than RDF. The high-chlorination might be caused -- might be cause the amount of more chlorine in ASR than RDF."

Did I read that correctly?

A. Yes.

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Did I read that correctly?

A. Yes.

Q. So what they're finding is that when they are burning refuse with PVC in it, they are creating dioxin-like PCBs; right?

MR. LAND: And take your time to read through the document if you need to to confirm that.

THE WITNESS: (Reviewing document.)

Yeah, I mean they say that dioxin-like PCBs were generated during pyrolysis.

(Reporter clarification.)

THE WITNESS: Sorry. Sorry. Sorry.

They -- they do say that dioxin-like PCBs were generated during pyrolysis reactions with PVC present, so that is what they concluded. Again, I haven't read the paper carefully, so I don't know if I agree with those conclusions, but that's what they concluded.

MR. LAND: Whenever you read, read slow --

THE WITNESS: Yeah, sorry.

MR. LAND: -- that way she can take it.

THE WITNESS: I tend to talk fast. Sorry.

MR. GOUTMAN: Why don't we mark as Exhibit 12...

(Exhibit Rodenburg-12, multipage document entitled Formation of PCDDs, PCDFs, and Coplanar PCBs from Incineration of Various Woods in the Presence of Chlorides, is marked for identification.)

MR. GOUTMAN: Ready?

BY MR. GOUTMAN:

Q. Marked as Exhibit 12 a paper by Yasuhara, Y-A-S-U-H-A-R-A, titled, "Formation of PCDDs, PCDFs, and Coplanar PCBs from Incineration of Various Woods in the Presence of Chlorides."

Did I read that correctly?

A. Correct.

Q. Are you familiar with this paper?

A. Again, not ringing a bell. I may have read it, but if so, I don't remember it.

Q. But it just -- I just want to

direct your attention to the right column halfway down the first paragraph there, "Therefore, there are many reports on the formation of dioxins and dioxin-like compounds from various woods upon combustion."

And you're familiar with that literature, the burning of wood can create dioxin and dioxin-like compounds --

A. Yes.

Q. -- is that correct?

A. Yes.

Q. And dioxin-like compounds would include dioxin-like PCBs; correct?

A. Usually, yes.

Q. And if you turn to Table 3, which is on -- couple pages in, it does note analytical results from exhaust gases from combustion of samples. And on the bottom it does indicate the formation of what they call coplanar PCBs; correct?

A. Correct.

Q. And those are dioxin-like PCBs; right?

A. I believe so, yeah.

Kentucky, Minnesota, or Florida, it's all mixed together?

A. Well, I'm assuming your samples are all tagged with latitude and longitude.

Q. Yeah, I understand that, but in the PMF analysis in this hypothetical, you're mixing them all together, you're including them in the same analysis, right, and you're identifying factors; correct?

A. Yes.

Q. So isn't it true that geographic heterogeneity might limit the extent to which a PMF analysis can give you useful information?

MR. LAND: Objection, misleading, incomplete hypothetical.

THE WITNESS: As long as your samples are tagged with latitude and longitude, you can back out the spacial information, so I don't think it limits you.

BY MR. GOUTMAN:

Q. Okay. Going back, you put -- you put this -- load this data into your computer

and you ask your computer model to generate factors, what's called factors; correct?

A. Correct.

Q. And you compared those factors to certain Aroclors; correct?

A. Correct.

Q. And in your report you identify specifically your methodology, and you -- if I can find it -- I believe compared it to 1016, Aroclor 1242, 1248, 1254, and 1260; correct?

A. Correct.

Q. So that was your methodology. And you did not compare the factors to byproduct profiles; correct?

A. When I found factors that were not similar to any of the Aroclors, I did compare them with what I knew about inadvertent PCBs.

Q. That wasn't my question and I think you know it wasn't my question.

You did not design this by -- by comparing by way of PMF analysis any non-Aroclor profiles, you used only Aroclor profiles; correct?

MR. LAND: Objection, misleading,

asking the question I asked.

BY MR. GOUTMAN:

Q. In fact, there are by -- there are byproduct profiles for numerous products that are -- that you are not aware of that are, for example, listed in products in Exhibit 9 that we discussed in some detail; correct?

MR. LAND: Objection, vague, incomplete hypothetical.

THE WITNESS: Presuming that the products listed in that table really do have PCBs in them, then, yes, there may be other fingerprints that I'm not aware of.

BY MR. GOUTMAN:

Q. And for purposes of preparing your report, you did not go out and research any of these products that are listed in Exhibit 9 to determine what, if any, information there is on byproduct PCB profiles in these products; correct?

A. Only for the pigments in the -- in the silicones.

Q. And you certainly didn't compare them to any byproduct profiles from the

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MR. LAND: Objection, misleading.

Go ahead.

BY MR. GOUTMAN:

Q. By the very design of your analysis; correct?

A. The R2 shows you how similar it is to an Aroclor, yes.

Q. And not how similar it is to a byproduct PCB; correct?

A. Correct.

Q. And we've discussed in some detail in your previous deposition these cutoffs, and I asked you the following question at Page 133 of your deposition:

"I couldn't look in a handbook, textbook, or peer-reviewed article which will tell me that a sample with an R2 value of .5 is either a weather -- weathered Aroclor, something that never was an Aroclor, or something that always was an Aroclor?"

And you answered, "Correct."

A. Yes, that's what I answered.

Q. And that would be your answer today; correct?

A. Correct.

Q. And I asked you:

"If I were to say -- tell you that in my opinion the upper cutoff limit of .8 should be .9, how would you disprove that?"

And you answered, "I couldn't disprove it."

MR. LAND: Right real quick. If you remember that from memory, then go ahead and answer, but if you need to review --

MR. GOUTMAN: Yeah, we'll --

MR. LAND: -- the document to make sure --

MR. GOUTMAN: -- we can waste everyone's time.

MR. LAND: Well, I'm saying you can ask in different ways. If she agrees with it now, that's one thing, but if we're going to ask if that's exactly what she said --

MR. GOUTMAN: Well, I'm going to ask it the way I want to --

MR. LAND: -- I think we should --

MR. GOUTMAN: -- and you can make

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Q. I'm at Page 133, and we'll do this the hard way. Okay?

Question Page -- Line 3:

"Let me ask it this way -- in this way -- let me ask it this way. I couldn't look in a handbook, textbook, or peer-reviewed article which will tell me that a sample with an R2 value of .5 is either weather -- a weathered Aroclor, something that never was an Aroclor, or something that always was an Aroclor?"

And your answer was what --

A. Correct.

Q. -- and that is true today; correct?

A. Correct.

Q. And I asked you:

"If I were to tell you that in my opinion the upper cutoff limit of .8 should be .9, how could you disprove that?"

And what was your answer under oath?

A. "I couldn't disprove it."

Q. And that is true today; correct?

A. Correct.

Q. And then I asked:

"If I were to say the lower cutoff should be -- instead of .4, it should be .5, .6, .7, how would you scientifically disprove that?"

And your answer was?

A. "I can't disprove it."

Q. And that answer is true today?

A. Yes.

Q. And am I correct that these cutoffs that you used here have never been subjected to a peer review in a peer-reviewed journal?

A. Correct.

(Counsel confer.)

MR. GOUTMAN: I'd like to show you a Exhibit 19, which is a paper that you cite in your report.

(Exhibit Rodenburg-19, two-page document entitled Determination of Polychlorinated Biphenyls Using Multiple Regression With Outlier Detection and Elimination, is marked for identification.)

MR. GOUTMAN: For the record, this is a paper by Burkhard, B-U-R-K-H-A-R-D, and Weininger, W-E-I-N-I-N-G-E-R, titled "Determination of Polychlorinated Biphenyls Using Multiple Regression With Outlier Detection and Elimination."

BY MR. GOUTMAN:

Q. And you're familiar with this article; right?

A. Yes.

Q. And just if you go to the second page, they're talking about COMSTAR; is that correct?

A. Yes.

Q. And that's a PMF program similar to the one that you use?

A. No, COMSTAR is different.

Q. It is a -- it is a method of PMF analysis; correct?

A. No, as I understand it, COMSTAR is more of a MLR, similar to MLR.

Q. It -- I understand. Okay. Fair enough.

But what it sets forth here, and

this is, again, a paper that you cited, it sets forth R2 values that the authors deem acceptable. And it says, and I'm quoting in the second page right here (indicating) --

A. Uh-huh.

Q. -- "From our experiences with COMSTAR, acceptable COMSTAR solutions are obtained when the following conditions occur: First, R2 for the analysis is greater than .9."

Is that what it says?

A. That's what it says.

Q. And right above that it says, the fourth table, Table 1, a turtle sample -- by the way, this is about analysis of PCBs; right?

A. Yes.

Q. "The fourth sample, a turtle sample, illustrates the behavior of COMSTAR with severely imperfect input data. For this sample, COMSTAR analysis failed, i.e., COMSTAR was unable to find a subset of PCB peaks which forms a self-consistent PCB population. This failure is shown by the smaller R2 value, 725"; correct?

A. That is what it says.

Q. Now, I don't know if I asked you this, but these cutoffs that you include in this report, do they appear -- I think I asked you whether you've ever published in the peer-reviewed literature.

Have you ever seen it anywhere else in a study in a peer-reviewed journal?

A. No.

Q. The second criterion that you used, it says -- this is on Page 14 of your report, the second full paragraph.

A. Hold on. I lost my report. Is it -- yeah, here we go. Okay. What page?

Q. Page 14.

A. Okay.

Q. Second full paragraph, the second criteria is that -- I'm just quoting from your report -- is that, "When the agreement between Aroclor and the factor is less than .4, the differences between the Aroclor and the factor cannot be explained by any known weathering phenomenon."

Is that what it says?

dechlorination of -- of Aroclors.

BY MR. GOUTMAN:

Q. But -- but my question is: Some of those same congeners that are, quote, as you say, typically produced by dechlorination may also be congeners created as byproduct PCBs; correct?

A. That's correct.

Q. And so how can you tell them apart? Like what scientific test can you do so that another scientist can say, "Oh, yeah, that is dechlorinated as opposed to a congener that was created as a byproduct PCB and was never an Aroclor"?

A. Well, again, you compare the fingerprint that's generated to known weathering processes; and if it is similar to a known weathering process that you know is based on a weathering result of an Aroclor, then you can make the -- the conclusion that that PCB came from the Aroclor -- you know, it's just been weathered, but it originally came from an Aroclor.

Q. So that sounds circular to me.

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CERTIFICATE

COMMONWEALTH OF PENNSYLVANIA)

) ss:

COUNTY OF PHILADELPHIA)

I, Debra Sapio Lyons, a Registered Diplomat Reporter, a Certified Realtime Reporter, a Certified Realtime Captioner, an Approved Reporter of the United States District Court for the Eastern District of Pennsylvania, a Certified Court Reporter for the State of New Jersey; and Notary Public within and for the States of New Jersey, New York and the Commonwealth of Pennsylvania do hereby certify:

That Lisa A. Rodenburg, Ph.D., the witness whose deposition is hereinbefore set forth, was duly sworn by me and that such deposition is a true record of the testimony given by such witness, to the best of my ability and thereafter reduced to typewriting under my direction.

I further certify that I am not related to any of the parties to this action by blood or marriage and that I am in no way interested in the outcome of the matter.

In witness whereof, I have hereunto set my hand this 23rd day of December, 2019.

Debra Sapio Lyons

_____

DEBRA SAPIO LYONS
CRR, RDR, CRC, CCR, CPE